Fever management audit: Australian nurses' antipyretic usage

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ABSTRACT

Do nurses manage fevers of children hospitalised for a febrile illness ritualistically or rationally? Nurses recorded temperatures more frequently during the first 8 hours in the ward with a mean frequency of 13.36 (SD 4.76, range 5 to 24) during the first 24 hours following admission. In the majority of cases there was a strong 2nd hourly pattern of temperature monitoring according to the time of day (eg., 0600hrs, 0800hrs, 1000hrs). Seventy-six percent of children (51) received at least one antipyretic. The mean temperature when antipyretics were administered was 38.34°C (SD 1.02, range 35.9°C to 40.8°C). Highest antipyretic administration occurred during the daytime and highest temperature recording during the nighttime. Antipyretic administration and mean temperatures generally followed a similar pattern, excepting at 0800 and 1600 hours when antipyretic administration was high and mean temperatures low. Nurses' knowledge, attitudes and decision-making criteria toward fever management need investigating to explain these irregularities.

Key Words: fever management; antipyretic usage, temperature recording, pediatric nurses, febrile seizures, febrile hospitalised children.

FEVER MANAGEMENT AUDIT: AUSTRALIAN NURSES' ANTIPYRETIC USAGE

For more than 2 decades the risks and benefits of fever have been debated along with the efficacy and necessity of reducing fevers with antipyretics. In Australian, pediatric nurses are the health professionals who spend the most time with hospitalised febrile children. When a febrile child is admitted to hospital, physicians generally write an antipyretic/analgesic order, eg., Paracetamol (Acetaminophen) to be administered every 4 hours, when required (q4h prn). Physicians do not identify a temperature above which this medication is to be administered to reduce fever. The decision when to administer the antipyretic is made by the registered nurse caring for the child. Differences in this practice provided the impetus for this investigation. For example, one nurse may administer an antipyretic when the child's temperature is 37.5°C and another nurse may wait until the child's temperature reaches 39°C. Nurses' rationales for antipyretic administration were not routinely recorded. This paper reports the findings from a retrospective chart audit.

RELEVANT LITERATURE

The use of antipyretics in fever management is controversial. Fever enhances the immunological response to disease by enhancing initial antigen recognition, increasing the activity of host defences and susceptibility of antigens to mobilised defences (see, eg., Rowsey, 1997a, 1997b; Mackowiak & Plaisance, 1998). Antipyretics reduce fever by approximately 2°C (Schmitt, 1993) and they interfere with the body's immunological response to disease (Rowsey, 1997a; Rowsey, 1997b; Mackowiak & Plaisance). Nurses report administering antipyretics to febrile children to reduce fever and the associated symptoms and to prevent febrile seizures (FS) (Kluger, 1992; Thomas et al., 1994; Poirier, Gonzalez-del-Rey, Monroe, & Davis, 1998).

Conflicting results have been found in antipyretic efficacy in illness management. Some studies describe a prolongation of the disease process. Schmitt (Schmitt, 1991) found children receiving antipyretics took longer to recover from measles and chicken pox than those taking a placebo. Other studies report longer recovery time in rhinovirus infected adult volunteers treated with antipyretics in respect to viral shedding and nasal signs and symptoms and impaired antibody response compared to the placebo group (Stanley, Jackson, Panusarn, Rubenis, & Dirda, 1975; Graham, Burrell, & Douglas, 1990). Kramer found no differences in fever duration or symptoms in a double randomised blind study of the effects of acetaminophen on fever duration and symptoms (Kramer, Naimark, Roberts-Brauer, McDougall, & Leduc, 1991). Other rationales for antipyretic administration are to increase comfort, activity and appetite. In Kramers' study, nearly half the parents incorrectly guessed which group their child had been in, antipyretic or placebo, even though they were monitoring their child's activity, alertness, mood, comfort and appetite and fluid intake (Kramer et al.,). Other carefully controlled studies have not reported increased comfort in patients receiving antipyretics (Plaisance & Mackowiak, 2000). These findings challenge the use of antipyretics and arguments for their use in relieving discomfort and anorexia associated with fever.

Should nurses administer antipyretics in pediatric fever management, and if so, when? Recommendations in the literature are confusing. Mild temperatures, up to 39°C, appear to have few detrimental effects in humans and in animal studies, these mild temperatures enhance some immunoregulatory functions. However, there appear to be no beneficial effects from high fever (Kluger, 1986). Medical guidelines advocate antipyretic use for temperatures above 39.0°C (Baraff, Bass, & Fleisher, 1993). Lorin (Lorin, 1994) advocates their use in

children with fever of 40°C or higher, an underlying neurological or cardiopulmonary disease, heat illness (raised temperature from an external cause eg., excessive exposure to the sun) or risk of a FS. Others agree with their usage in patients with minimal cardiac reserve as the increased cardiovascular and metabolic demands associated with fever may not be tolerated in these patients (Holtzcalw, 1992; Lorin, 1994; Henker, 1999). In the absence of nursing guidelines, Thomas recommended nurses administer Paracetamol 15mg/kg for fevers above 38.3°C and should this be ineffective in reducing the temperature, to administer Ibuprofen 10mg/kg (Thomas, 1996). Keagle (Keagle, 1999), also recommended 38.3°C but reminds us that it is more important to treat the child than the numbers on the thermometer. A recently published systematic review of fever management in children recommends selective and cautious use of antipyretics in otherwise healthy children (Watts, Robertson, Thomas, & Panel, 2001).

Febrile seizures commonly occur in between 2% to 5% of children under the age of five years (Adam & Stankov, 1994) and nurses attempt to prevent them through antipyretic administration (Kluger, 1992; Thomas et al., 1994). Febrile seizures are benign, determined largely by genetic factors and a prime example of the developing brain's susceptibility to seizures and its ability to outgrow this susceptibility (Stenklyft & Carmona, 1994; Hirtz, 1997). Some authors have recommend using antipyretic therapy in children with a history of FS to reduce the probability of another seizure (Rosenthal & Silverstein, 1988; Styrt & Sugerman, 1990; Lorin, 1994) but recent studies argue against their use (Van Esch et al., 1995; Sagraves, 1999). Many children who have a FS have had an antipyretic prior to their first seizure (Berg et al., 1995) and there is no evidence that either intermittent or aggressive antipyretic therapy prevents recurrent FS (Schnaiderman, 1993; Uhari, Rantala, Vainionpaa, & Kurttila, 1995; Sagraves, 1999).

With all the conflicting advice in the literature in relation to fever management with antipyretics and antipyretic use to prevent FS it is understandable that there are observed differences in nursing practice. To promote effective nursing management of fever it was important for a study to be undertaken to determine the current practices of nurses toward fever and fever management with antipyretics. Findings from this study will enable nurses to reflect upon their practices and examine the determinants of these practices, leading to informed decision making and effective practice in the fever management of hospitalised children.

Aim of the study

The aim of the study was to document nurses' practices in relation to the administration of prn antipyretics ordered by physicians for children with fever.

METHOD

Study Design

A retrospective chart audit was utilised to explore and describe current fever management practices.

Hospital protocols

Nurses' fever management practices need to be examined in the context in which they occur and this includes the directions given to them by physicians. Protocols for the ordering and administration of antipyretics vary between hospitals. For the hospital involved in the study, the fever management procedures are noted below. They include:

- temperatures are measured using a tympanic thermometer;

- for children admitted with a febrile illness temperatures are taken hourly until the fever settles, then every 2 to 4 hours until discharge;
- antipyretics/analgesics are ordered by physicians q4h prn (every four hours as required) on admission;
- Paracetamol (acetaminophen) is the most common antipyretic ordered;
- generally, no specific temperature is identified by the physician for antipyretic administration;
- no differentiation in antipyretic order to identify administration for fever or pain;
- antipyretics are administered at the discretion of the nurse caring for the child and
- all medications are checked with another nurse prior to administration.

Sample

The charts of all children admitted for a febrile illness in the two Medical wards of a Metropolitan Tertiary Referral Pediatric Hospital in Queensland, Australia during the previous 7-months (1st September 1999 to 31st March 2000, the summer months), were targeted. There were 1098 admissions to these two wards during this time. To be eligible for inclusion, children had to be aged between 3 months and 10 years and admitted for a febrile medical illness, eg., pneumonia or tonsillitis. Children known to be immunosuppressed or with pre-existing neurological or oncological conditions were excluded from the target sample. The date of admission, hospital identification numbers and diagnoses of all children admitted for a febrile illness, 237 admissions, were collected in order of admission. Alternate charts were selected, resulting in 118 charts. When these charts were examined for data collection, additional exclusion criteria available only at this time, were included. They were:

- afebrile during the first 24 hours in the ward,
- in the ward for less than 8 hours,
- admitted to the ward from a source other than the Department of Emergency Medicine (DEM), eg., intensive care unit, inter-hospital transfer,
- signs of cerebral irritation on admission, and/or had
- afebrile or complex seizures, ie., those lasting more than 15 minutes (Baumann, 1999), prior to or at admission,
- a seizure chart in the ward, and/or
- a diagnosis of epilepsy.

Charts of children with these exclusion criteria were removed from the selected sample and 67 charts remained in the audit.

Instrument

An audit tool was developed to enable the collection of demographic information, temperatures, antipyretic orders and antipyretic administration during the first 24 hours. Other information collected included:

- diagnoses and comorbidities,
- FS history,
- antipyretic administration prior to presentation at the hospital,
- temperatures, antipyretic orders and administration in the DEM,
- temperatures, antipyretic orders and administration during the first 24 hours in the ward,
- antibiotic administration during the first 24 hours in the ward,
- White Cell Count (WCC) on admission and
- length of hospitalisation.

The tool was piloted on charts of 12 febrile children admitted to one of the target wards 12 months previously. Following this, the tool was revised to enable data collection to follow the flow of the charted information.

Procedure

Following the granting of ethical approval from the appropriate ethics committees the ward admission books from the two Medical wards included in the study were examined. Information collected at this stage included the child's hospital identification number and diagnoses on admission of all children aged less than 11 years who had been admitted for a febrile illness. Nineteen charts were from children aged between 6 and 10 years were identified and 7 did not meet the final eligibility criteria. Charts from children aged 72 to 120 months were then excluded from the sample as no real comparisons between children 3 – 71 months and those 72 – 120 months would be possible. Alternate charts were selected from the recorded list of children admitted with a febrile illness. Following this, 118 charts were examined in the Medical Records Department. A further 51 charts were rejected as ineligible according to the eligibility criteria and information from eligible charts recorded on the audit tool.

All quantitative data were entered into SPSS and qualitative data were coded prior to data entry. Data were analysed for frequencies, means and standard deviations and by Chi square and -tests. Mean temperatures were calculated to enable analyse of temperatures by antipyretic administration, demonstrating nurses' clinical practices in fever management.

Nurses' administrating the antipyretic medications at the participating hospital were registered nurses practicing at either a Level 1 or Level 2. In this state Level 1 nurses are registered nurses responsible for providing direct care for a specific patient population and Level 2 nurses are registered nurses with additional clinical responsibilities, eg., orientation and preceptorship of new staff, staff development, and research (ANRAC, 1990).

RESULTS

Demographics N=67

The sample reasonably balanced in terms of gender (male 51%), age, most (64%) were aged between 3 and 23 months (Mean 24.6 months; SD 17.04 months) and weight, between 6.7 to 26.4 kg (Mean 12.5kg; SD 3.52). Diagnoses on admission included pyrexia of unknown origin (PUO), pneumonia, tonsillitis, upper respiratory tract infections (URTI), urinary tract infections (UTI), gastroenteritis and other diseases and some children had multiple diagnoses. These demographics are presented in Table 1. Few children had known comorbidities, WCC ranged from 4.2 to 47.6 (Mean 16.52; SD 9.43) and the length of stay in hospital ranged from 0.7 to 22 days (Mean 2.80; SD 2.65). More than two-thirds (65.7%) of the sample received antibiotics, 87% intravenously and 13% orally. Younger children, under the age of 2 years, were hospitalised for longer, two days or more, than children 2 years and older (χ^2 p = .005). Mean hospitalisation for younger children was 3.14 days (SD0.48) and for those 2 years and older, 2.18 days (SD 0.25).
Insert Table 1 about here

Temperature

Recorded temperatures ranged from 34.2°C to 40.8°C with the mean temperatures for each child ranging between 35.85°C and 38.48°C. Mean temperatures were examined by both time since admission and time of day. Slight rises in mean temperature occurred 5 hours following admission to the ward, 37.56°C, and at 23 hours, 37.60°C (see Figure 1). The lowest mean

temperature was recorded at 0400 hours (36.78°C) and the highest at 1500 (38.01°C). There was another peak at 1900 hours (38.00°C) (see Figure 2). These mean temperatures early morning and late afternoon highlight the fact that temperatures continue to follow a circadian pattern in febrile children and febrile children receiving antipyretics (Morley, Herson, Thornton, & Cole, 1992).
Insert Figures 1 and 2 about here

Temperature recording

Temperatures were recorded between 5 and 24 times during the first 24 hours in the ward (Mean 13.36; SD 4.76) with the majority of children's temperatures recorded between 8 and 15 times. Temperatures were recorded more frequently during the first 8 hours following admission and tended to be taken every 2 hours during this period. During the following 7 hours, temperatures were taken less frequently with no real temperature taking pattern emerging. For the remainder of the audit period (between 16 to 24 hours following admission) less than 50% of children had temperatures recorded each hour with the least number of recordings (37%) at 21 and 23 hours. When temperature recording was examined by time of day a strong second hourly pattern emerged with temperatures recorded more frequently between 1900 hours and 0500 hours and less frequently between 0700 hours and 1700 hours.

Antipyretic administration

Most children had a medical order for at least one type of antipyretic and some children had an order for more than one antipyretic. Therefore, all antipyretics ordered and administered during the first 24 hours in the ward were included. These included paracetamol, ibuprofen and liquigesic-co analgesic syrup (paracetamol 120 mgs and codeine phosphate 5mg per 5 mls). Sixty-six of the children (98.5%) were ordered an antipyretic during the audit period and of these, 90% were ordered on an as required basis (q4h prn, ie., every 4 hours when required). Antipyretics had been administered to nearly three-quarters (73.1%) of the sample in the DEM prior to admission to the ward.

Fifty-one children (76.1%) received at least antipyretic dose. Seven hundred and sixty (760) temperatures were recorded for these children and antipyretics were administered 149 times, that is, at 149 temperature points, 19.6% of recordings. The mean recorded temperature for children who received an antipyretic was 37.44 (SD 1.08) and the mean recorded temperature when an antipyretic was administered was 38.34 (SD 1.02). Temperatures when antipyretics were administered ranged from 35.9°C to 40.8°C. See Figure 3. This figure shows that the majority of recorded temperatures were below 37.5°C and antipyretic administration increased with temperatures of 37.8°C and above. Forty-five percent of antipyretic administration occurred when temperatures were below 38.3°C. As these medications also have analgesic properties, they may have been given for pain relief or to enhance comfort. However, neither the rationale for administration of the medication nor its effect was recorded in the charts.
Insert Figure 3 about here

Children diagnosed with PUO, tonsillitis, URTI and/or gastroenteritis were more likely to be ordered more than one type of antipyretic. Mean antipyretic administration was 2.86 (SD 1.78) ranging from 1 to 9 administrations during the 24 hour period. Nine children received more than 4 doses of antipyretic. Of those 9 children, 6 received 5 doses, two received 7 doses and one 9 doses. Five of these children (56%), had a history of FS and one or more FS during this illness and one (11%) had their first FS with this illness. The child who received 9 doses of antipyretic was ordered Paracetamol q4h prn and Ibuprofen q6h prn. This child received 6

doses of Paracetamol and 3 doses of Ibuprofen when temperatures ranged between 37°C and 40°C. Fifteen of 23 recorded temperatures (65%), for this child, were above 38.3°C.

Antipyretics were administered sporadically during the first 24 hours in the ward with the most frequent administration during the first 5 hours and again at 9 and 13 hours following admission. Antipyretics were administered throughout the day with most frequent administrations at 0800 and 1600 hours and a more even distribution between 0200 and 0600 hours. Antipyretic administration generally followed mean temperatures excepting at 0800 and 1600 hours, times that coincide with the beginning of new shifts.

Febrile Seizure sample (FS)

Thirteen charts (19.4%) were from children who had a FS immediately prior to or at admission. Of these, 9 (70%) were from children who had had a previous FS. Eight (61.5%), had a history of FS and a number had been admitted numerous times during the audit period, although not all admissions had been selected.

To determine different nursing practices when caring for FS children, differences between the FS and non-FS samples were examined. There were no significant differences in gender (males 53.8%) age, although more of the FS sample were aged between 12 and 23 months, weight or WCC. The FS sample were significantly more likely to be hospitalised for more than 2 days (FS = 87%, non-FS = 13%: χ^2 p = .007). The FS sample was more likely to have a diagnosis of PUO or URTI and comorbidities of recurrent FS (31.6%) and/or a family history of FS (21.1%). No significant differences were found between mean temperatures in the FS and non-FS samples. During the first 24 hours in the ward the entire FS sample were ordered Paracetamol and 38.5% were also ordered Ibuprofen.

DISCUSSION

Interestingly, the audit demonstrated that the majority (64.2%) of children hospitalised for a febrile illness were under 2 years of age. Approximately 25%, were aged between 3 and 11 months and 40% between 12 and 23 months of age. These younger children were hospitalised for more than 3 days, longer than the older children (24 to 71 months). The most common diagnoses on admission were PUO, pneumonia, tonsillitis, URTI, UTI and gastroenteritis, few had known comorbidities, WCC ranged between 4.2 and 47.6 and more than half (65.7%) received antibiotics during the audit period.

Most of these febrile young children, below 2 years of age, are unable to verbally communicate with the nurses caring for them. They depend on their parents to interpret their needs and their nurses' experience to anticipate and/or to interpret these needs and concerns. These children are very vulnerable when parents are unavailable, a phenomena occurring more frequently with the trend for both parents to work. Children are becoming more reliant on the experience of the nurses caring for them. Therefore, nurses caring for febrile children must ensure their practice is theoretically based; focusing on the best interests of the child. When nurses are inexperienced in fever management or treat fever ritualistically rather than rationally, then the children in their care might not be receiving the best possible care.

Temperatures

There was a large range in the recorded temperatures, 34.2°C to 40.8°C, with individual children's mean temperature ranging from 35.85°C to 38.48°C. Slight rises in mean temperatures occurred 5 and 23 hours following admission. The temperature rise 5 hours following admission may indicate that the antipyretics received in the DEM by 73% of

children had ceased to be effective as Paracetamol, the most frequently administered antipyretic (received by 83% of children) has an elimination half-life of 1 to 3 hours (MIMS Australia, 1996-1999). Interestingly, temperatures in febrile children and children receiving antipyretics followed a circadian pattern with the highest means at 1500 and 1900 hours (38.01°C and 38.00°C respectively). The lowest mean temperatures were recorded at 0400 hours (36.78°C) indicating that the temperatures of febrile children and febrile children receiving antipyretics follow a circadian fluctuating pattern governed by the regulatory centre in the hypothalamus (Morley et al., 1992). These circadian fluctuations need to be incorporated into nurses' management of fever as a rise in temperature late in the afternoon may not be reflecting heightened fever, but this natural occurrence.

A wide range in temperature taking was identified. During the 24 hour period, children had their temperature recorded between 5 to 24 times. The majority of children had between 8 and 15 temperatures recorded. More frequent temperature taking occurred during the first 8 hours following admission and during the evening and night shifts. The high mean temperatures 5 hours following admission and nurses assessment of newly admitted children's fever pattern could in part explain the frequent temperature taking during the first 8 hours. They also take temperatures hourly when children are febrile to observe the fever pattern. Interestingly, there was no corresponding increase in temperature taking 23 hours following admission when mean temperatures again rose, leading to some speculation. Have nurses by this time identified fever patterns and with this knowledge are they more reluctant to administer antipyretics to prevent temperatures rising, instead, allowing fever to run its course. Contrary to this was the nurses' practice of taking temperatures every 2 hours according to the time of day (eg., 0600hrs, 0800hrs, 1000hrs), leading one to question the proported practice of taking temperatures on an individual as needed basis.

The literature does not provide a consistent definition for a temperature at which an individual is said to have a fever. In 1978, Fletcher defined fever as any temperature greater than or equal to 37.8°C (Fletcher, 1987), in 1993 Bonadio identified 38.0°C (Bonadio, 1993). With no definite temperature in the literature one would expect some variation in the temperatures nurses use. Is it necessary for a definition of fever to be established and utilised by nurses in their fever management and/or a temperature at which it is deemed advisable to administer antipyretics? Should physicians be more directive when they order antipyretics, identifying a temperature above which antipyretics may be administered?

Antipyretic administration

Numerous studies support that fever is beneficial in promoting host defences, yet, physicians continue to prescribe antipyretic therapy (Klein & Cunha, 1996). Antipyretics were ordered for 98.5% of children in this study with at least one dose administered to 77.7% of those ordered. More frequent antipyretic administration was correlated with the more frequent temperature recording that occurred during the first 5 hours in the ward, FS with this illness or a history of FS. Most children had an antipyretic in DEM and the peaks in antipyretic administration occurred 5, 9 and 13 hours following admission a q4h pattern (a pattern of administering antipyretics every 4 hours). The antipyretic administration in this study, to 77.7% of 67 children, is higher than that discovered in another Australian study by Penna in 1993 (Penna, Dawson, & Penna, 1993) in which 64% of 299 hospitalised children received an antipyretic. Antipyretics were administered at 19.6%, nearly 1 in 5 temperature recordings. These results are high, higher than those previously reported. Is this rate of antipyretic administration necessary? This question highlights the need for nurses to record their rationales for antipyretic administration. Are nurses administering antipyretics frequently,

every 4 hours, rather than taking hourly temperatures and monitoring the child's progress through temperature and other physical signs, eg., dehydration, the most common side effect and principal danger associated with fever (Reeves-Swift, 1990; Holtzcalw, 1992)? Rationales were not recorded in this study; therefore, it is difficult for the authors to answer this question and identifies the need for further research into nurses' management of pediatric fevers.

Temperatures when antipyretics were administered ranged from 35.9°C to 40.8°C. Other authors found similar variation in nurses' antipyretic administration practice. For example, Thomas (Thomas et al., 1994) found nurses initiated fever management interventions for temperatures ranging from 37.8°C to 40.6°C and Adbullah (Abdullah, Ashong, Al Habib, Karrar, & Al Jishi, 1987) 37.5°C to 38.5°C. In the current study nearly half the antipyretics (45%) were administered for temperatures below 38.3°C, the temperature recommended by Thomas (Thomas et al., 1994). As rationales for antipyretic administration were not documented in the charts, and there was no differentiation in medication order for fever or pain, we are unable to explain this high rate of antipyretic administration to children with low-grade fever. The authors assume that antipyretics administered when temperatures were below 37°C were not for fever management. Most authorities on fever agree that only high fever, 40.0°C or higher, does not enhance the immune process and should be avoided in weak or debilitated patients (Kluger, 1986; Styrt & Sugerman, 1990; Holtzcalw, 1992; DeBuse, 1994). Temperatures below 39°C are regarded by Holtzclaw (Holtzcalw) as mild fever. These nurses seem to be administering antipyretics for mild fever, halting the body's natural defences.

Different fever management practices at different times of the day

During the audit period, antipyretic administration decreased during the nighttime and temperature taking increased. The times when the greatest numbers of antipyretics were administered were 0800 and 1600 hours when mean temperatures were low, between 37.2°C and 37.4°C (overall range 36.8°C to 38.0°C). At 0800 and 1600 hours nurses may be more aware of their patient's condition. These times coincide with the beginning of the morning and afternoon shifts. At this time new staff meet their patients and their parents, assess the patients, take their observations and discover how they have been over the last few hours. As a result of this assessment nurses may decide an antipyretic/analgesic is required and sometimes parents request an antipyretic/analgesic. However, other medications are also administered at these times and antipyretics may have been administered for convenience. Nurses caring for a specific child have access to another nurse to check the antipyretic, so administration at a time when more nursing staff are available may be a time management strategy. If the latter is the reason for increased antipyretic administration then nurses may be administering antipyretics/analgesics unnecessarily, preventing immunological responses to fever assist the child's recover.

During the nighttime the temperature at which nurses administer antipyretics rises. This finding raises certain questions about fever management. Are nurses observing their patients more closely through their hourly temperature taking? If nurses can adjust this antipyretic administration temperature for the nighttime when there is a low nurse-child ratio, then, why can they not continue this practice during the day when the ratio is higher? These questions need to be explored through further research.

Febrile Seizures

The rate of FS in this study was 19.4%, significantly higher than that found in the general community (2-5%) (Adam & Stankov, 1994). Most children in the FS sample (70%) had a history of FS, therefore, a probability of further FS (Berg et al., 1995). Nurses did treat these

children differently. More frequent antipyretic administration, ie., greater than 4 doses per 24 hours, was found in more than half of the children (66.6%) with a history of recurrent FS and/or a FS during the present illness. Many studies report the nurses' rationale for administering antipyretics is to prevent FS, but antipyretics have not been found to prevent recurrent FS (Schnaiderman, 1993; Uhari et al., 1995; Sagraves, 1999). Nurses consider FS the primary danger associated with fever and many use paracetamol as the first line treatment in their prevention (Poirier et al., 1998).

Nurses reading articles recommending the use of antipyretics for children at risk of FS may adopt this recommended and unsubstantiated practice (DeBuse, 1994; Stenklyft & Carmona, 1994; Hirtz, 1997). Additionally, a high percentage of febrile children in their care, 20%, fall into this category, significantly more than in the general population, 2 to 5% percentage (Adam & Stankov, 1994). Therefore, nurses practicing in this manner who are caring for a higher population of children with a history of FS would be administrating antipyretics frequently, to prevent further FS. Nurses, new to a clinical area, may through observing these fever management practices might adopt these unsubstantiated practices. In addition, they might generalise these practices to all febrile children. Others may simply do this over a period of time, unnecessarily administering antipyretics. The high proportion of FS these nurses observe, 20% of all children admitted with a febrile illness, might reinforce inappropriate fever management practices.

Limitations

These audited charts were of children admitted during the summer months. One could wonder whether the demographics and results of this study would differ if it had been conducted during the winter months when more children with chronic respiratory disorders are admitted, eg., asthmatics with an associated respiratory infection. A limitation to understanding the real reason for antipyretic administration was that documentation of the rationale for administration was not recorded. This limits a clear understanding of nursing practice.

Conclusions

Febrile children admitted to medical wards are likely to be less than 2 years of age and unable to communicate their needs to the nurses caring for them. These nurses are responsible for observing their condition and managing their fever. One of the ritualistic nursing actions associated with fever management is the administration of antipyretics in an attempt to reduce fever and prevent FS. Antipyretics do not prevent FS, they interfere with the body's defence mechanisms in combating disease. Nurses practicing in this way may be harming the children in their care. Watts recommends fever management interventions support the body's physiological febrile responses and that other interventions must be carefully considered prior to implementation (Watts et al., 2001). Fever management practices altered with time of day. Why then, was the best practice, at nighttime, not continued throughout the day? This audit of nursing practices has highlighted a deficit in nurses' documentation practices and a lack of clarity in the ordering of medications that have dual actions, ie., antipyretic and analgesic. The systematic review of fever management also recommended that the purpose, when intervening in fever management, must be clearly identified through documentation (Watts et al.,).

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Table 1: Demographics of audited children admitted for a febrile illness N = 67

	f	%
Age in years		
< I year (3 – 11 months)	17	25.4
1 year (12 – 23 months)	26	38.8
2 years (24 – 35 months)	9	13.3
3 years (36 - 47 months)	5	7.5
4 years (48 – 59 months)	6	9.0
5 years (60 – 71 months)	4	6.0
Diagnosis at admission	***N = 84****	
Pyrexia of unknown origin	18*	21.4**
FS	13	15.5
Pneumonia	15	17.9
Tonsillitis	9	10.7
Upper respiratory tract infection	11	13.1
Gastro-enteritis	7	8.3
Urinary tract infection	6	7.1
Other	5	6.0
FS prior to or at the time of admission		
Yes	13	19.4
No	54	80.6
Previous FS		
Yes	10	14.9
No	57	85.1

* Number of identified diagnoses

** Percent of responses

Figure 1: Mean temperatures since admission to the ward

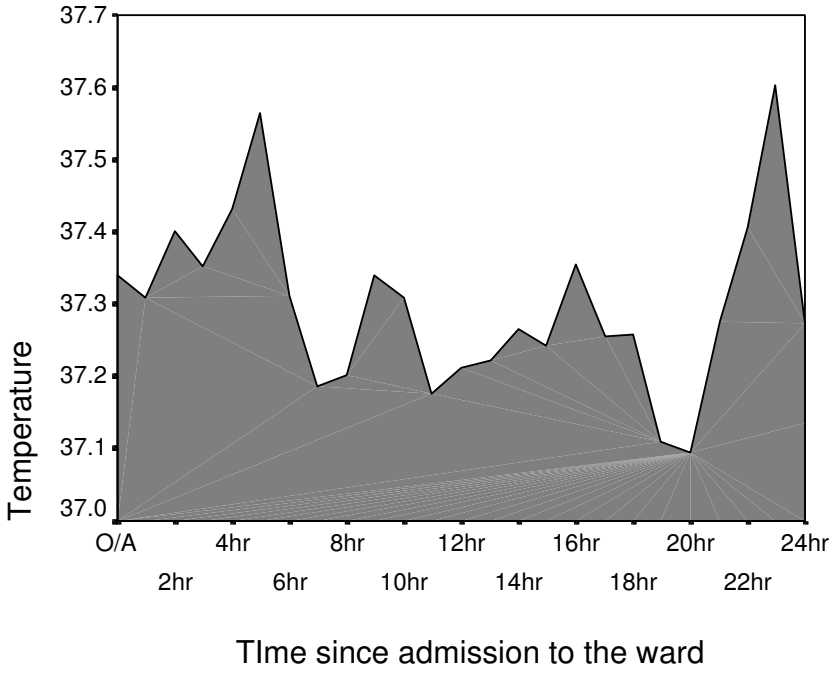


Figure 2: Mean temperatures by time of day N = 67

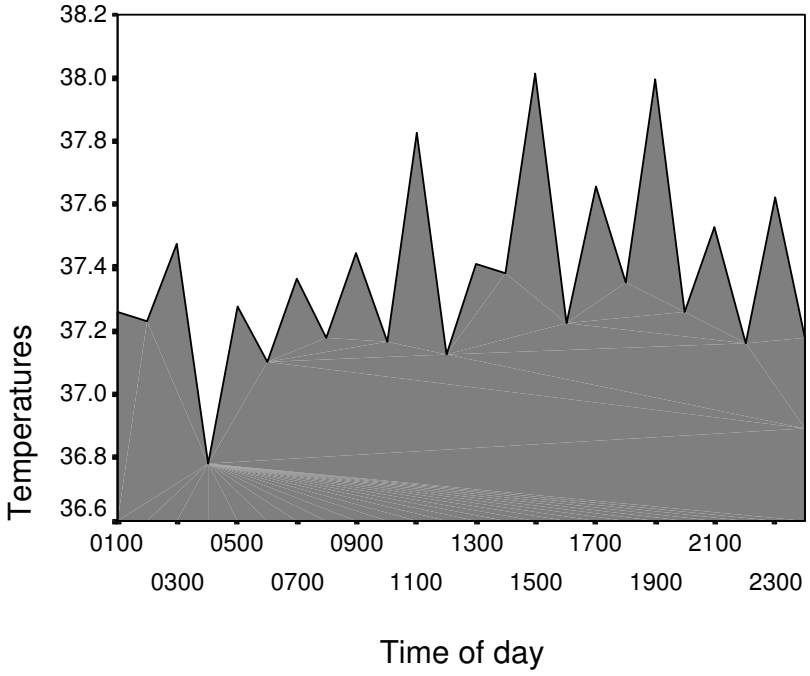
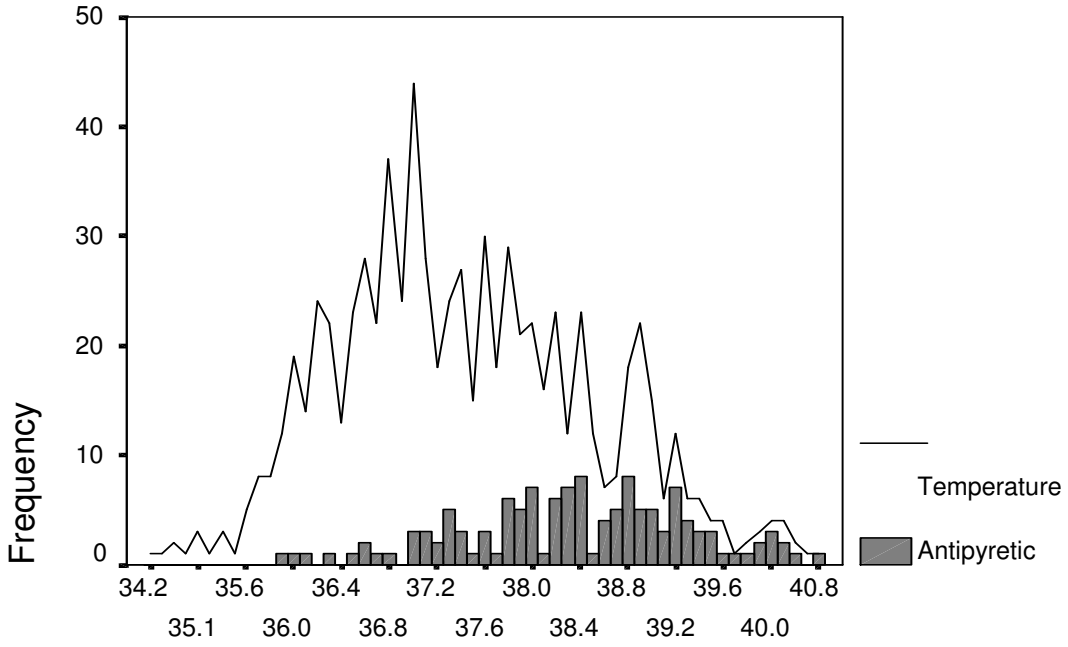


Figure 3: Temperatures when antipyretics were administered N = 51



Temperatures when an antipyretic was administered